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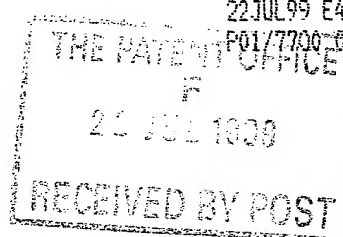
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Signed *Andrew Gersey*
Dated 10 March 2000

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(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

1.	Your reference	DC/P5515UK		
2.	Patent application number (The Patent Office will fill in this part)	9917075.5		
3.	Full name, address and postcode of the or of each applicant (underline all surnames)	McGill Technology Limited McGill Technology Building Endeavour Park, London Road, Addington, West Malling, KENT, ME19 5TW		
	Patents ADP number (if you know it)	06755417002		
	If the applicant is a corporate body, give the country/state of its incorporation	GB 102		
4.	Title of the invention	Blending Apparatus		
5.	Name of your agent (if you have one)	Lewis & Taylor		
	"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)	5 The Quadrant Coventry CV1 2EL		
	Patents ADP number (if you know it)	711001 10		
6.	If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or each of these earlier applications and (if you know it) the or each application number	Country	Priority application number (if you know it)	Date of filing (day / month / year)
7.	If this application is divided or otherwise derived from an earlier UK application, give the number and filing date of the earlier application	Number of earlier application	Date of filing (day / month / year)	
8.	Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'yes' if: a) any applicant named in part 3 is not an inventor, or b) there is an inventor who is not named as an applicant, or c) any named applicant is a corporate body. See note (d))	yes		

9. Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document

Continuation sheets of this form	-
Description	7
Claim(s)	-
Abstract	-
Drawing(s)	5

10. If you are also filing any of the following, state how many against each item.

Priority documents	-
Translation of priority documents	-
Statement of inventorship and right to grant of a patent (<i>Patents Form 7/77</i>)	-
Request for preliminary examination and search (<i>Patents Form 9/77</i>)	-
Request for substantive examination (<i>Patents Form 10/77</i>)	-
Any other documents (<i>please specify</i>)	-

11. I/We request the grant of a patent on the basis of this application.

Signature

David R Cowan

Date

21 July 1999

12. Name and daytime telephone number of person to contact in the United Kingdom

David R Cowan
01203 222756

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Blending Apparatus

This invention relates to blending apparatus particularly apparatus for blending food product. The invention has more particular application to the blending and dispensing of product in a container for consumption, for example food products such as milk shakes.

- 5 An object of the invention is to provide improved blending apparatus.

According to the invention blending apparatus comprises a container having an upper opening and a base, a hollow member upstanding from the base and having an opening at its lower end, a blending element locateable within the container and over the hollow member for rotation relative to said member to blend food product within the container, the blending
10 element being driveable by drive means locateable within the hollow member through said opening to drivingly engage the blending element.

The hollow member may be formed with an opening at its upper end through which the blending element is accessible by the drive means to drive the blending element. The blending element is preferably sealingly engageable with said opening for rotation relative
15 to said hollow member.

In one arrangement the blending element comprises a driven member which extends through the upper opening in the hollow member and drivably engages with a drive shaft of the drive means which extends upwards from a drive motor.

Further features of the invention will appear from the following description of an
20 embodiment of the invention given by way of example only and with reference to the drawings, in which:

Fig 1 is a vertical section through a container having a blending element;

the portion 20 is open and at the opening is formed a tapered seating 22.

A blending element 23 is arranged to sit over the upstanding portion 20 and comprises a sleeve whose inner surface is shaped to fit rotatably over the outer surface of the hollow portion 20. The blending element 23 carries at spaced position along its length outwardly directed blending blades 24, in this case formed as two vertical rows at opposite sides of the element 23. The blades 24 are arranged so that upon rotation of the blending element 23 about its axis the blades engage with the product within the container to cause it to be blended. Other blending elements 23 than that shown may also be used or the blending element may be omitted in which case the portion 20 is closed at its upper end.

At the upper end of the blending element 23 there is formed a driven member 25 arranged to extend downwardly through the open end of the hollow portion 23 into the seating 22. At its lower end the driven member 25 is formed with means to engage a drive member 26 (Figs 2 and 3) to be described.

The components of the container 10 would normally all be of plastics material made by any suitable moulding process, but other materials may be used such as paper based materials. As seen in Figs 5 and 6 the blending element 23 is capable of being stacked one on top of the other by the provision of longitudinally extending slots 27 formed in opposite sides of the element to receive within the slots the blending blades 24. Similarly, as seen in Fig 6, the lids 16 are arranged for stacking one on top of the other. Although not shown will also be evident that the containers 10 are stackable one inside the other with the upper ends of the hollow portions 20 engaging through the lower openings 21 of adjacent containers when so stacked. The rim portion 15 of each container engages below the shoulder 14 of a container located on another container. Such stackability ensures that the component parts are able to be transported with minimum volume after manufacture and during transportation to an assembly location.

The containers 10 are taken to an assembly and filling location where product is introduced into the container through the upper end to the predetermined desired level within the

container. Before or after filling the blending element 23 is located over the hollow portion 20. After filling the film 18 is located over the upper opening to seal said upper opening and the lid 16 is applied over the upper lip 15 of the container. If desired a seal may also be applied to the lower base 12 of the container to seal the opening 21 and such seal may be heat sealed and in the form of a film similar to the film 18.

Filled and sealed containers may then be cooled or frozen to the desired storage temperature. In the present case the apparatus described for blending is assumed to be dealing with frozen product within the containers 10 which needs to be brought up to a blending and dispensing temperature but the container of Fig 1 may be used in alternative apparatus without a heating function.

The filled and cooled/frozen containers of product may then be stored and transported to the point of blending and consumption. Such storage will be at the desired temperature in a refrigerated environment.

Referring now in particular to Figs 2 and 3 there is shown apparatus for blending the product within the container 10 ready for consumption. The apparatus comprises a housing 30 in which is located a compartment 31 which is a generally cylindrical compartment open at its upper end and having a releaseable closure member 32 for the upper opening. At its lower end a drive shaft 33 extends upwardly through the base of the compartment 31 from a drive motor 34. Upstanding from the base of the compartment 31 is a pedestal member 34 of tapering shape corresponding to the internal dimensions of the hollow portion 20 of the container. At the upper end of the shaft 33, which extends through the pedestal member 34, there is provided the rotatable drive member 26 arranged to engage the driven member 25 on the blending means 23. As shown in Fig 2 the container 10 is being loaded into the compartment 34 so that the blending means 23 is in driving engagement to be driven by the drive motor 34. The closure member 32 is in the open position having been pivoted to such position about a pivot 36. The closure member 32 carries a counter weight 37 to assist in the opening action which may be manually operated or power driven to automatically open and close.

The compartment 31 comprises a microwave compartment whereby microwave energy from a microwave power source 38 in the housing 30 supplies microwave power to the compartment 31 in its closed position (Fig 3) to warm up the product within the container 10. Thus after the container 10 has been loaded into the compartment 31 with the drive means 26 and driven means 25 in driving engagement the closure member 32 is moved to the closed position. After completion of the loading of the container into the compartment 31 and the closure of the closure member 32 microwave power is directed into the compartment from the source 38 to heat the product within the container to the desired temperature. The duration and power of the microwave energy is determined according to the initial temperature of product within the container, the amount of product within the container, the nature of product within the container and the desired final temperature of product within the container. Such duration and power of the microwave energy may be determined automatically upon reading data on the container and by reading the initial temperature of the container. Such data may also prevent operation of the apparatus should the container and its contents not meet the desired parameters, for example if the product has passed its sell by date, the container is not filled with product etc.

In heating the product within the container by microwave radiation the compartment may be tailored to the size of the container and the microwave energy may be imparted to the food product using the internal opening within the container, if necessary.

After heating the product in the container the drive means 34 is operated to rotate the blending means 23 to blend the product which is then ready for consumption from the container or after being transferred to another container.

In the assembly of the blending element 23 with the container the driven member 25 may be located in the seating 23 as a force fit and a seal is moulded into the seating 22, preferably in the form of a liquid seal. Thus although the upper end of the other portion 20 may be above the level of product within the container it is preferred that there is a seal between the portion 20 and the element 23.

Referring now to Fig 4, there is shown an alternative form of container which is intended to simulate a cocktail glass. In this case the container includes a base portion (Fig 7) in the form of a disc 40 and upstanding from the base is a tapered hollow portion 42 extending upwards and arranged to be inserted into a body member 43 (Fig 8) in the shape of a goblet, i.e. of circular cross section and curved inwards towards its lower end. The upper end of the goblet 43 is open, and during blending the body 43 has located therein a blending element 44 located over the upper end of the hollow member 42 within the body 43. The blending element 44 and the drive to said element is similar to that described for the previous embodiment. Thus the product is filled into the body portion 43 and such product is blended by rotating the blending element 44 about its axis, as previously described. This container may have a lid 45 which may be raised and may simulate an umbrella in a manner of cocktail containers. The body member 43 is located onto the base portion 40 after blending for consumption of product and the base portion may be of reusable, for example of glass. Alternatively the product is poured out of the body 43 into another container for consumption.

The containers described may be used independently of the microwaveable heating arrangement, especially if the food product is already at the desired blending temperature. In other respects the drive arrangement and pedestal support may be as described but it will no longer be necessary to have the closed compartment around the container.

It is intended that the container and the blending element be disposed of after blending and consumption of the product. Access to the product in the container after blending may be through the lid 16 and the seal 18 (if present) using a straw. Alternatively the lid 16 may be removed and access is through the seal 18. However, the lid 16 and seal 18 can both be removed for consumption of product or the product may be poured into another container, for example a reusable glass container.

Sauces and other additives can be made to the container prior to or during blending, if required. Such additions will usually be through the lid and seal.

The container may be in different sizes according to the product contained or individual customer requirements. To achieve different sizes the member 2, may remain the same size with the height and/or diameter of the container being changed. In some cases the base of the container may be clear of the base of the compartment with the container supported on
5 the mandrel 34.

The inner surface of the member 21 may be polygonal shape with the mandrel 34 of corresponding section. The length of the drive dog 25 may be varied to maintain engagement with the drive 26 according to the size of the container.

10 The container 10 may be provided over its internal surface with ribs (not shown) which extend longitudinally of the container from the lower end towards the upper end. Such ribs assist in agitating the product in the container during blending to improve the blending action. The spacing and depth of the ribs may be selected according to the nature of the product, the form of blending means and the speed of rotation of such blending means.

15 The product may be frozen carbonated product or beverage in which carbon dioxide is introduced into the product at or after filling into the container and the product is then frozen to retain the gas within the product. Product flavours may be added to the product at the point of sale i.e. during blending and dispensing, as described., The product may alternatively be aerated at the blending stage.

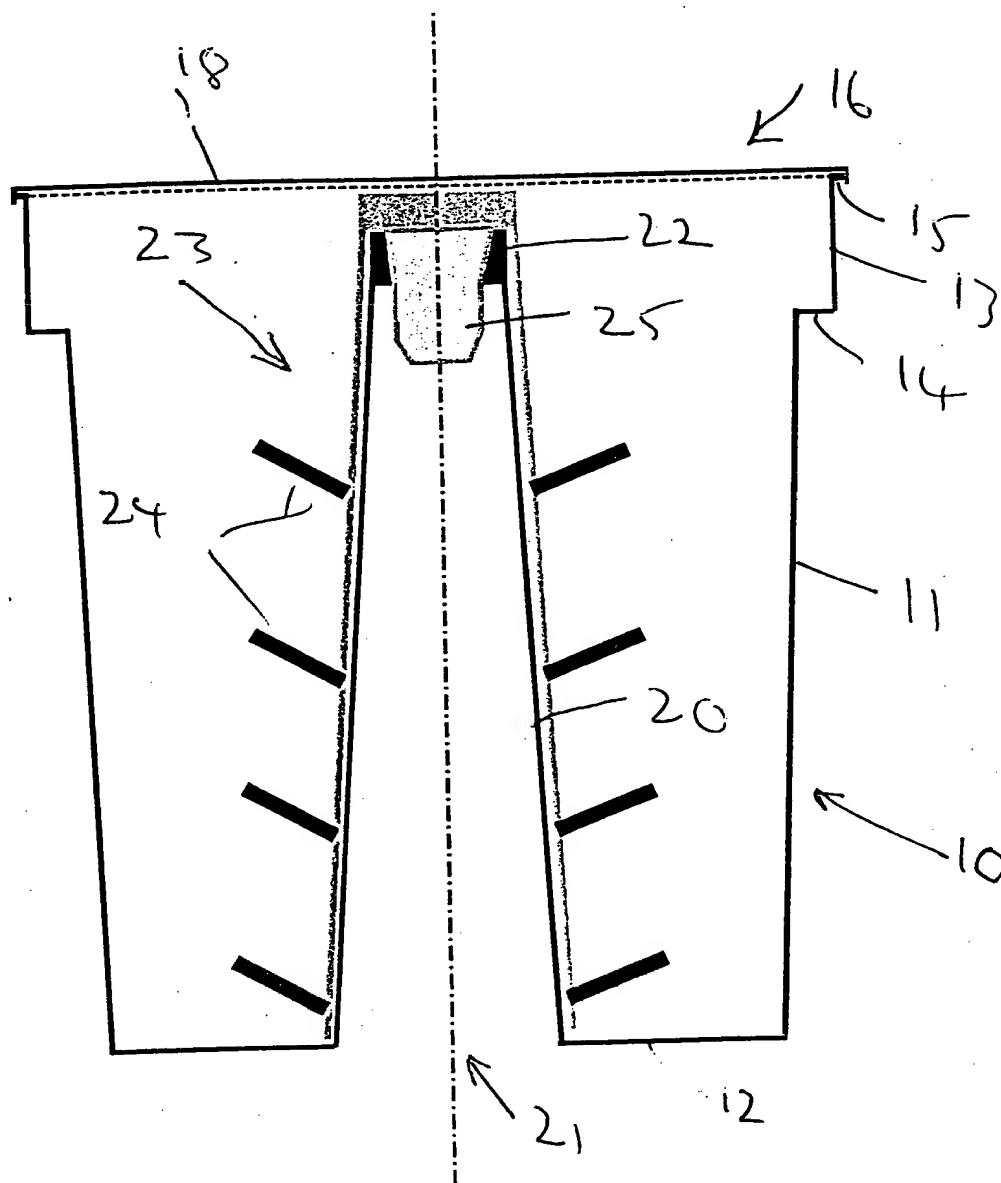


Fig 1



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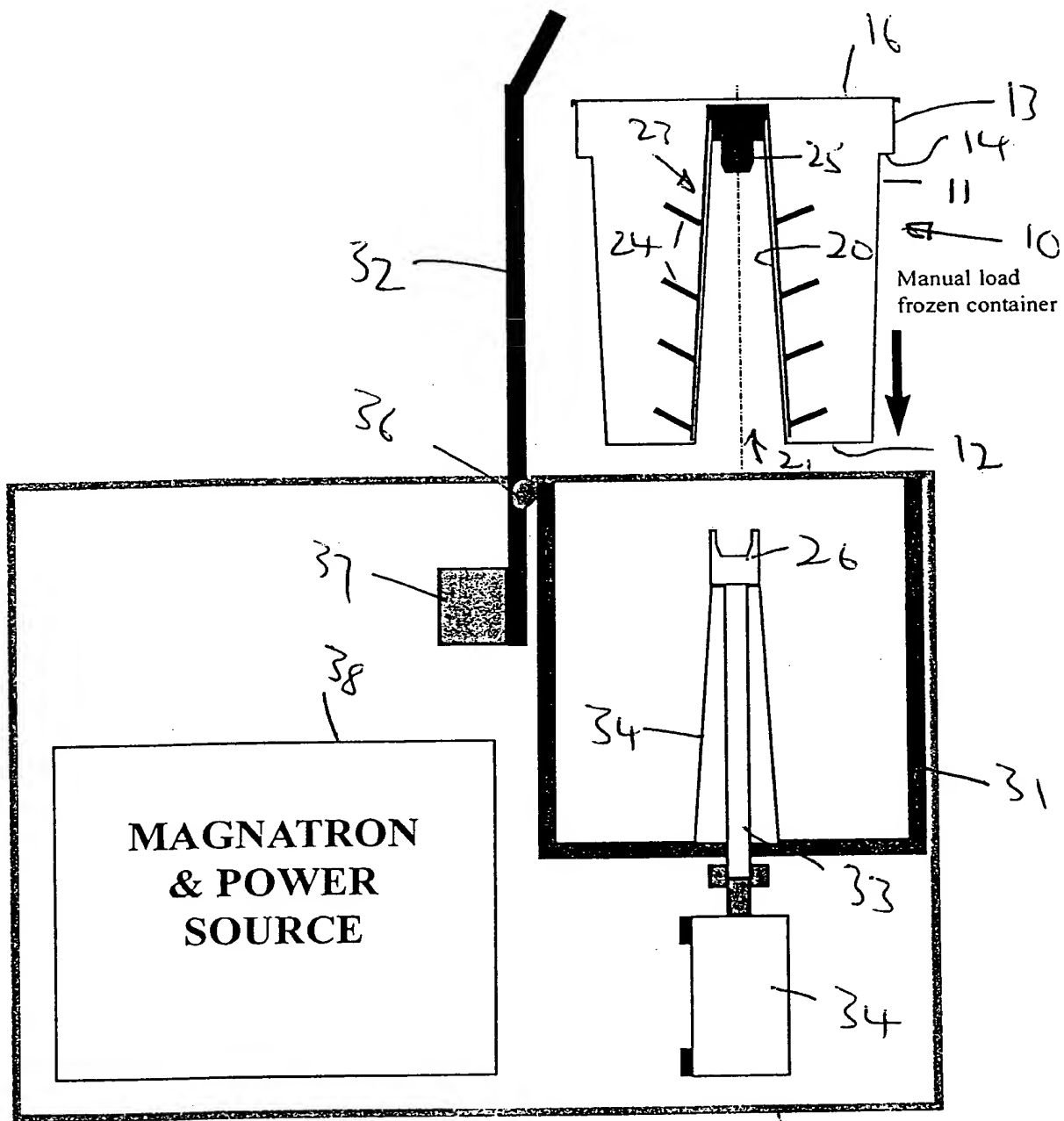


FIG 2



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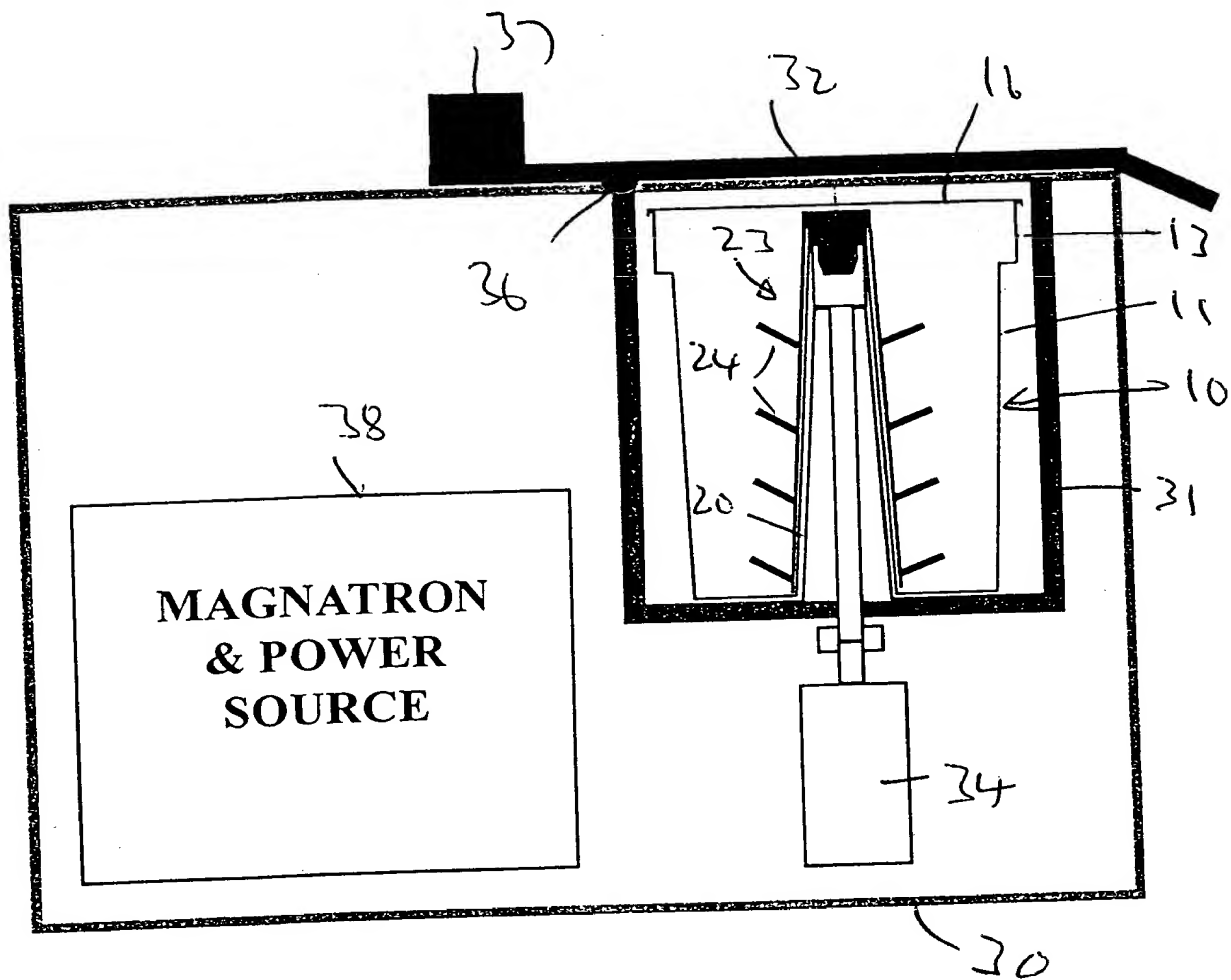


FIG 3



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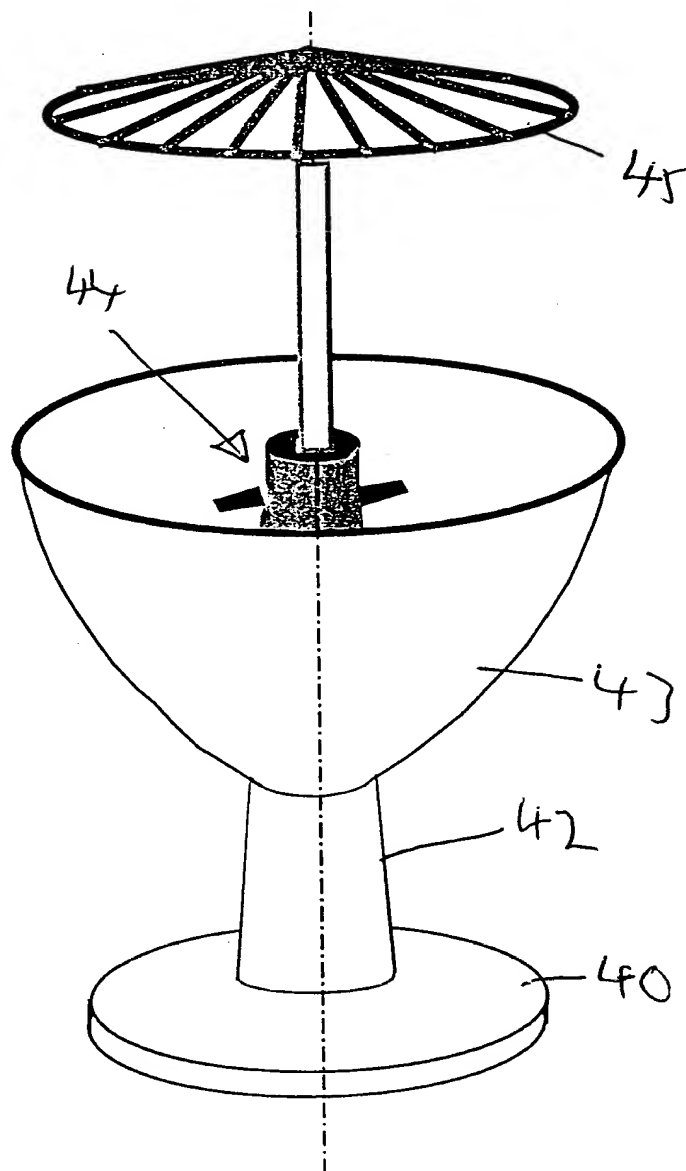


FIG 4

FIG 252



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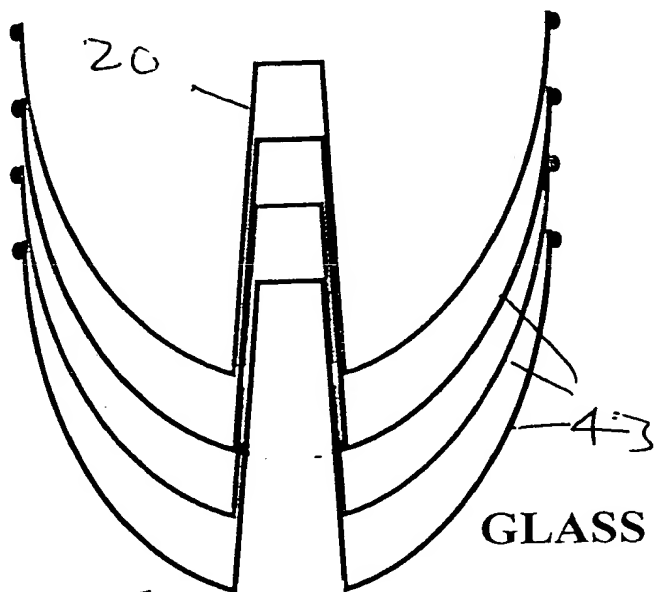


FIG 4

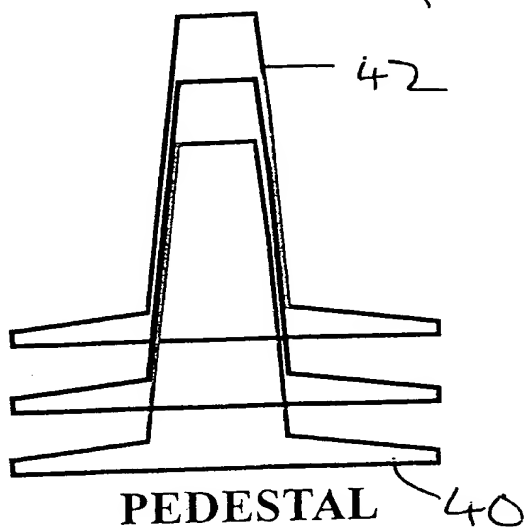


FIG 7

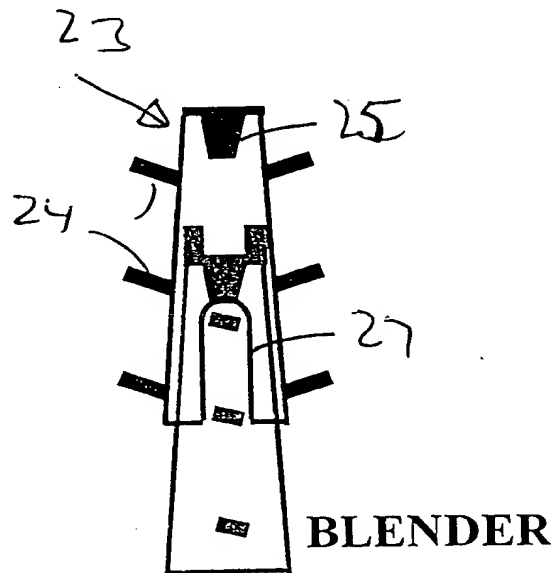


FIG 5

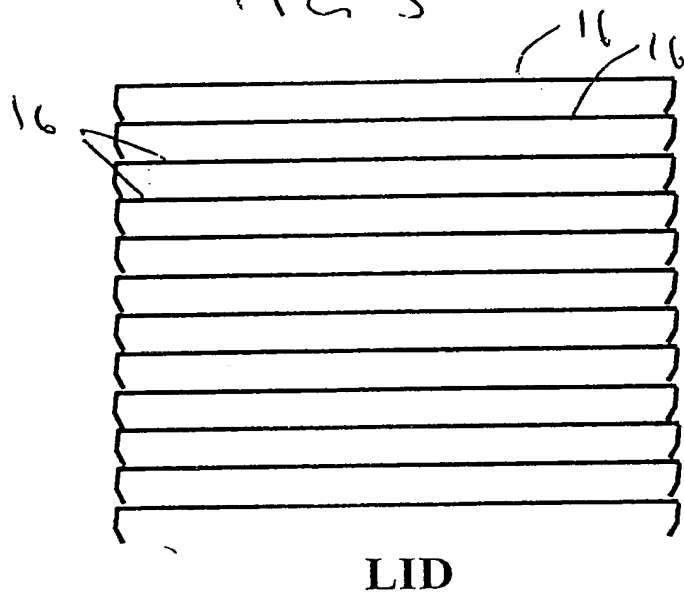


FIG 6

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Lewis + Taylor